UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

_____x

ADVANCED VIDEO TECHNOLOGIES LLC,

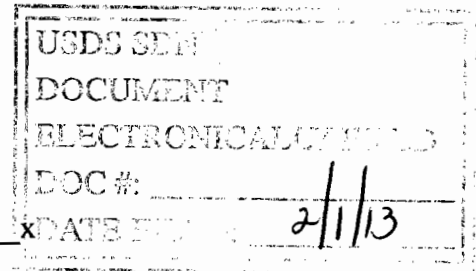   Plaintiff,   11 Civ. 6604 (CM)

       -against-

HTC CORPORATION and HTC AMERICA, INC.

                    Defendants.

_____

ADVANCED VIDEO TECHNOLOGIES LLC,

                    Plaintiff,   11 Civ. 8908 (CM)

       -against-

RESEARCH IN MOTION LTD. et al.,

                    Defendants.

_____x

ADVANCED VIDEO TECHNOLOGIES LLC,

                    Plaintiff,   12 Civ. 0918(CM)

       -against-

MOTOROLA MOBILITY LLC,

                    Defendant.

_____x

CLAIM CONSTRUCTION

McMahon, J.:

    These matters all assert claims of patent infringement by plaintiff Advanced Video
Technologies (AVT) against manufacturers of smart phones that contain video cameras. AVT is

1

the holder of U.S. Patent 5,781,788 C1 (the '788 patent). The patent covers a single semiconductor chip with interface to an external Dynamic Random Access Memory (DRAM) that both compresses (for storage) and decompresses (for display/viewing) video data that originated from an external source (i.e., the camera in a smart phone).

This decision deals with claim construction pursuant to *Markman v. Westview Instruments, Inc.,* 52 F. 3d 967 (Fed. Cir. 1995)(en banc), *aff'd* 517 U.S. 370 (1996). Most of the claims were construed on the record at a hearing held in open court on January 16, 2013; this opinion will memorialize those constructions and finalize a few more.

The parties have provided the court with a list of disputed claim terms. I construe them as follows:

"A single semiconductor chip" – means "one and no more than one semiconductor chip." Unlike AVT and HTC, I see no need to construe the term "semiconductor chip."

"An interface connected to the chip for external circuitry" – means "circuitry connected to the chip that enables external transfer of data."

"As simple as an absolute difference" – I disagree with HTC that this term is indefinite under 35 U.S.C. § 112. In context, this language makes perfect sense.

Claim 5 as amended recites a video codec (compressor/decompressor) "wherein the video compressor/decompressor includes a process for comparing the macroblocks for the current frame at time "t" with the macroblocks of a previous frame "t-1", and the displacement vector within a defined search window that provides a minimum cost function, which can be as simple as an absolute difference, is the motion vector and is encoded by variable length coding." This phrase describes a process that located video data at any two different points in time. "Displacement" would be understood by one skilled in the art as the measure of the movement of the data points in the picture taken between one frame and the next. Think of a series of cells in a hand-drawn animation, each one of which shows the characters in a slightly different position, and the "displacement" is the measure of the distance between where the identical data point is located in one frame and the next. The "minimum cost function" is nothing more than "the quickest and easiest way to accomplish something" – in this case, the quickest and easiest way of establishing the displacement of a particular data point between time t-1 and time t. Absolute difference is a common mathematical concept; it represents the absolute value of the distance between two numbers, or, in spatial terms, the distance on a real line between the points corresponding to two points, x and y. It is always non-negative. In the context of the patent, which deals with the compression and decompression of video data, it refers to the distance between the position of a point of video data (a pixel) in two different frames (or at two different times, t-1 and t). The use of the words "as simple as" in the claim language does not render the phrase indefinite; since we are dealing with the minimum cost function for measuring the

displacement (i.e., the quickest and easiest way to accomplish that task), all the patentee is saying here is that the absolute value of the distance between the pixel's location at t-1 and t is the minimum cost function for measuring the displacement – it is as simple as that.

This being so, AVT's proposed construction, "the sum of the magnitude of differences between pixel locations" is acceptable. However, it is not clear to the court whether that would make the concept any clearer to a jury. It might be easier just to tell the jurors that the absolute difference between the same pixel at two points in time is the magnitude of the distance between them, and to illustrate that point by observing that the absolute difference between 5 and 2 is 3 (5-2=3), while the absolute difference between -5 and +2 is 7 (-5-(+2)=7).

"Dedicated hardware logic" – means "integrated circuitry that is set aside for the performance of specified tasks, such that those tasks cannot be performed by other integrated circuitry." It does *not* mean integrated circuity that is set aside for the performance of one and only one single task, because in this patent, particular hardware logic can plainly be dedicated to the performance of more than one task. In allowed claim 13, for example, dedicated hardware logic on the video compressor/decompressor performs "discrete cosine transforms on the video information received from the video input connection and….also performs inverse discrete cosine transforms on the video information received from the receive channel." In allowed claims 14 and 15 "the same dedicated hardware logic" of "the video codec of 13" "also performs" "zigzag operations on the video information" (Claim 14) and "quantization on the video information" (Claim 15).

However, when specific hardware logic is set aside for (dedicated to) the performance of a particular assigned task or tasks, no other integrated circuitry can be allowed to perform that task. So in the context of the '788 patent, no integrated circuitry other than the dedicated codec can be allowed to perform discrete cosine transforms and inverse transforms, or zigzags, or quantization of the video information.

"Quantization" – means "a process by which the continuous range of values of an input signal is divided into non-overlapping subranges." After hearing argument, I am convinced that one skilled in the art would so understand this term. AVT's proposed construction, "conversion of data from a relatively large set to a smaller and discrete set" is not only vague, but does not even conform to AVT's own description of the process of quantization, which was the collapsing of a set of data values between point x and point y into a single value (for example, all continuous data points between zero and two are assigned the value one).

"Inverse quantization" is, obviously, "a process in which the discrete values of an input signal that was previously quantized are converted back to a continuous range of values."

"Motion compensated using newly-computed motion vectors" – everyone agrees that the definition should begin with the phrase "compensating for the movement of pixel blocks

3

between video frames using motion vectors computed…." It is the end of that phrase that separates AVT and the alleged infringers.

AVT argues that the phrase "newly-computed" means "motion vectors computed based on the movement between frames." But nothing in that definition addresses the concept of the "newness" of this particular computation.

The question then becomes, "Newer than what?" The answer, according to HTC, is "newer than motion estimation." HTC derives this by looking at the language of Allowed Claim 5 "wherein, motion estimation is provided for luminance data only, and motion vectors for chrominance data is about one-half of that for luminance data, for a particular macroblock of four luminance blocks and two chrominance blocks, such that a frame at 't-1' is motion compensated using newly-computed motion vectors for both luminance and chrominance….." But nothing in the claim language precludes the use of estimation to perform the new computation (perhaps, as the claim language suggests, by estimating the luminance and then halving that estimate to calculate chrominance).

It seems to me that the parties are overcomplicating this claim term. I think what the phrase means is exactly what it appears to say: each time pixel blocks in a particular video frame are compared with those in an earlier frame (i.e., are "motion-compensated"), new motion vectors are computed; any prior calculation of that compensation, whether estimated or precisely computed, is not used. Unless someone can come up with a persuasive reason why the phrase does not mean what it appears to say, that is how I would define it for the jury.

"Video compressor/decompressor disposed fully within the chip" – is a term that self-defines and can be understood by a lay juror in accordance with its plain and ordinary meaning, which is that the video codec is located entirely within the single semiconductor chip.

"Video information received from said [the] video input connection" – is another term that needs no construction, because its plain meaning is easily understood by a lay juror once the juror knows what "video input connection" means.

"Video input connection" means "one or more external connection pins or ports used for receiving video data from a camera." As counsel for AVT have advised the court that there is no instance in the patent where the phrase "video input connection" is not either (1) followed immediately by the words "from a camera," or (2) referred back to an earlier occurrence of the phrase "video input connection from a camera," (see, e.g., "video information received from said video input connection," immediately above), there is no reason to define "video input connection from a camera" as a separate term.

"Video input data" is self-defining.

"Video input data from the video input connection" means "video data that is input via one or more external connection pins or ports used for receiving video data from a camera." Since the data that is received from a camera via the video input data is by definition uncompressed, this cannot include data that has been compressed.

This leaves two disputed terms for construction.

The first of the remaining terms is **"interim storage of incoming....video data."** "Incoming video data" is data that comes into the codec chip for processing. "Interim" means "temporary." In the context of this patent, the Dynamic Random Access Memory (DRAM) is used for the temporary storage of data. Indeed, in all the asserted claims where this phrase appears, the entirety of the reference reads, "an interface connected to the chip for external connection to a separate frame memory dynamic random access memory (DRAM) and that provides for interim storage of incoming and outgoing video data." Therefore this phrase means "temporary storage in the DRAM of video data that is coming into the codec chip for processing."

Obviously, video input data (uncompressed data that comes into the codec from the camera via the video input connection) is "incoming...video data." The question that occurred to the court after the *Markman* hearing was whether fully compressed data that arrives at the codec via the receive channel 22 for reverse processing (decompression) also falls under the definition of "incoming...video data." In the briefs and at the *Markman* hearing, discussion of the phrase "incoming video data" focused entirely on unprocessed video data that was entering the codec chip from the "video source" (i.e., a camera) via external connection pins or ports (the video input connection). (See Figure 2, showing data that enters the codec chip from a video source and proceeds to the D-RAM (which is external to the single semiconductor chip) after passing through a video input-output buffer 3) via a memory bus 4) through a D-RAM Controller and Scheduler 42.) No one ever suggested that the term "incoming...video data" could also encompass fully compressed video data that was being sent back through the codec chip to undergo reverse processing (decompression) before being sent out to a monitor for display – the only discussion of that "reverse flow" data was in terms of the phrase "outgoing video data." And yet, in the most technical sense, that compressed video data is "incoming;" it is coming back into the chip. Figure 2 shows it entering the chip via the receive channel 2) and proceeding back through something called a framing processor 3) and over memory bus 4) to the D-RAM controller and eventually into the D-RAM. Hence my question. I asked the parties to address it in supplemental briefing.

I have now reviewed the parties' responses. Unsurprisingly, AVT "agrees with the Court that the term 'incoming....video data' should be construed broadly to encompass video data that is entering the chip to be processed, i.e., uncompressed or compressed video data." (AVT Letter dated January 25, 2013.) There are two problems with AVT's sentence. First, since I had made

no decision about whether the term should be so construed, there was no settled "broad construction" with which AVT could agree. Second, the very fact that AVT never once suggested this possible "broad construction" until I asked the question strongly suggests that it was not what the patentee had in mind.

The briefs filed by HTC, Motorola and Research in Motion offer a far more satisfactory answer to the court's question, and convince me, on the basis of intrinsic evidence, that "incoming....video data" is limited to wholly unprocessed data that arrives from a camera to be compressed; it does not include compressed data that is re-entering the chip to be decompressed.

First, even AVT concedes that, for purposes of asserted independent claims 5, 13 and 26, and dependent claims 14, 15 and 22, "incoming video data" can only be unprocessed data that is coming in from the camera. Each of these claims uses the phrase "incoming video data" in the following context: "an interface connected to the chip for external connection to a separate frame memory dynamic random access memory (DRAM) and that provides for interim storage of incoming and outgoing video data, *wherein the incoming video data is video input data from the video input connection.*" As noted above, the "video input data from the video input connection" is the data that comes from the camera for compression. Therefore, for purposes of all these claims, the "incoming...video data" must be received "from a camera." It cannot come from anywhere else.

This leaves Claim 23, which reads in pertinent part as follows:

> *23. A video codec, comprising:*
>
> *a single semiconductor chip providing for [1] a video input connection from a camera and a video output connection to a monitor of decompressed data, and [2] a transmit channel and a receive channel of compressed data;*
>
> *an interface connected to the chip for external connection to a separate frame memory dynamic random access memory (DRAM) and that provides for interim storage of incoming and outgoing video data;*
>
> *a dynamic random access memory (DRAM) in communication with the interface, wherein the DRAM includes [1] segments for storage of video data compression and decompression frames, [2] a transmit buffer and a receive buffer;*

AVT argues that, because the "wherein" clause that appears in all the other claims after the words "incoming and outgoing video data" is not recited in Claim 23, the phrase "incoming...video data" must have a different meaning in Claim 23 than it does in all the other claims of the patent – this despite the usual rule that claim language must be interpreted

consistently across all claims in which it appears within a patent. *Southwall Techs., Inc., v. Cardinal IG Co.*, 54 F. 3d 1570, 1579 (Fed. Cir. 1995). The term here under discussion is "incoming video data," and it is quite clear that, in every other claim in the patent, "incoming video data" is data that enters the codec chip via the "video input connection" which runs "from a camera." Nothing in the language of Claim 23 suggests that the words should mean anything else in the context of Claim 23 and nothing in the specification does, either. For this reason alone, AVT's argument is unconvincing.

However, were this legal argument insufficient, there are two separate indications in the specification that explain why the answer to the court's question must be in the negative.

First, unlike video data that enters the codec chip from the video source for compression – which proceeds to the DRAM via an I/O buffer video 30 without being processed – data that is re-entering the codec chip via the receive channel 22 undergoes processing in a "framing processor" (FP) 38 before it proceeds to the DRAM. The processing in the FP is not, apparently, decompression; according to the specification, it involves the decoding of error correction codes (BCH codes) that are embedded in the received compressed video information stream. ('788 Patent, 5:18-23 and 9:7-11). Nonetheless, it is undisputed that the data that follows the path suggested by the court's question – i.e., that reenters the single integrated chip via the receive channel 22 – does not enter the DRAM in exactly the same format it had when it arrives at the chip via the receive channel. It is partially processed before it enters the DRAM. Since no video data that re-enters the chip for reverse processing ever makes it to the DRAM without being altered in the FP, compressed data that is slated for decompression cannot possibly be "incoming...video data" that is "temporarily stored" in the DRAM prior to being processed.

Second, when I asked my question, I had failed to focus on the following aspect of the claims: each of them refers to "a single semiconductor chip providing for a video input connection from a camera and a video output connection to a monitor of decompressed data, *and* a transmit channel and a receive channel of compressed data." In other words, Claim 23 recites two separate sets of pathways: one that explicitly applies only to decompressed (i.e., unprocessed) data and one that specifically applies only to compressed (processed) data. For decompressed data, there is a video input connection from a camera (for incoming data) and a video output connection to a monitor (for outgoing data). Both of those pathways are at what the court called "one end of the chip." For compressed data, there are transmit (outgoing) and receive (incoming) channels – pathways to which the terms "video input connection" and "video output connection" have no relationship. Compressed data cannot enter the codec chip via a "video input connection;" compressed data must travel through the receive channel – which is at "the other end of the chip."

Indeed, compressed data is not "video data" as that term is used in the patent. "Video data" appears to refer exclusively to uncompressed pixels. Data slated for decompression is

referred to as "compressed data received on the transmission channel." My problem is that I, a person decidedly not skilled in the art, think of all of the data – compressed, uncompressed, what have you – as "video data," simply because it was created when someone shot a video with a camera. But that is not how the patentee chose to employ the term, and that it not how the term would be understood by one skilled in the art.

I thus construe the disputed claim term "interim storage of incoming….video data" to mean the temporary storage, in the DRAM, of unprocessed video input data from the video source.

The second problematic term is the inverse of the one just discussed – **"interim storage of….outgoing video data."** The issue with this term is not so much defining it; indeed, that is a relatively straightforward exercise, in view of the discussion just had. The terms means "temporary storage of video data that has been decompressed prior to its passing through the video output connection to the monitor." Indeed, as HTC points out, it could not be otherwise, since AVT argued during reexamination that "outgoing video data" in the '788 does not undergo any processing when moving from the DRAM to the output of the video codec during transit. (*See* HTC Letter Br. of Jan. 25, 2013, Docket #48, at 5, and reference cited.) The only such "outgoing" video data is uncompressed data that leaves the external DRAM 42 via memory bus 48 and passed through the I/O buffer 30 on its way out to the monitor.

The quandary lies in having to deal with this term at all, since it seems that it ought not appear in the patent. But it does, in Allowed Claim 7, at Col. 3, line 25. So deal with it we must.

During the prosecution of the patent, the Examiner ruled that the patent did not disclose any method for sending outgoing video data into temporary storage. In an effort to distinguish the claimed invention over the prior art references, AVT attempted to add to claims 5, 6, 13 and 26 the phrase, "wherein the incoming video data is video input data from the video input connection and wherein the outgoing video data is decompressed data supplied to the video output connection to the monitor." (Bussey Ex. D at pp. 2-13). The Examiner denied the amendment on the ground that the patent specification did not contain written description support for it:

> Specifically, the examiner contends that the instant disclosure, as originally filed, does not appear to support limitations directed to the storing of the *outgoing* video within the DRAM with respect to the video system embodiment of figures 1 and 2 (as set forth in the claims of the amended claims of the proposed amendment): i.e., wherein "outgoing" is construed as being limited to that video which is provided to the monitor.

8

The Examiner also concluded that the specification's disclosure that "[a] separate dynamic random access memory (DRAM) 18 provides storage for incoming and outgoing video data" was insufficient to support the proposed claim amendments. (*Id.*) The Examiner cited a portion of the '788 patent specification that used the "incoming" and "outgoing" terminology as to refer to "the storage of the received video data being decoded and data that is being encoded for transmission, respectively." (*Id.*, at 6)[1]

AVT did not agree with the Examiner's conclusion that the disclosure failed to support limitations directed to the storing of outgoing video within the DRAM,[2] but it decided not to contest them. Instead, it filed a response in which it represented that "elements referring to storing outgoing video within the DRAM have been removed." If I were going to devise words to illustrate what it means for a patentee to give up particular claim language, I doubt I could be clearer. Elements referring to storing outgoing video within the DRAM were given up during prosecution of the patent. They cannot now be recovered. AVT is now estopped to argue to the court the position that it declined to pursue with the PTO.

The problem identified by defendants is that there is still language about storing outgoing video data in the patent claims. AVT removed the language about "outgoing data" being "decompressed data supplied to the video output connection to the monitor" from its proposed addendum to Claims 5, 6, 13 and 26. But it did not remove the reference to "outgoing data" being stored in the DRAM on an interim basis from Claim 7 (col. 3, line 25). Defendants argue that this invalidates the patent for indefiniteness. *LizardTech, Inc. v. Earth Resource Mapping, Inc.*, 424 F. 3d 1336, 1344-47 (Fed. Cir. 2005). They argued at the *Markman* hearing that summary judgment in their favor was the appropriate remedy.

AVT argued at the *Markman* hearing that the Examiner had erred in his conclusion. But that argument gets plaintiff nowhere, because AVT declined to make it when and where it counted – to the Examiner on reexamination. It has been waived and abandoned.

Nonetheless, AVT argues that it would be error to grant summary judgment dismissing these cases on the ground that the patent is indefinite for failure to provide written support for

---

[1] Additionally, the Examiner found that the outgoing video data as stated in the claim also lacked written description support because the output monitor that receives the outgoing video data is NTSC-compatible or PAL-compatible and thus the codec needed to "provide for block-to-raster-scan conversion so as to produce the video output that is provided to the 'NTSC-compatible or PAL-compatible' output device." The Examiner saw no evidence of written description "pertaining to any kind of block-to-raster-scan conversion process" or how that process was to be performed. (*Id.*) This aspect of Motorola's argument was not discussed at the *Markman* hearing and I fail to see how it is necessary to the task at hand, which is interpreting the phrase "temporary storage of…outgoing video data."

[2] AVT did not contest the Examiner's definition of the term "outgoing," either, which suggests to the court that "outgoing video data" is limited to data that has been decompressed and is being fed back out for display on a video monitor; it does not extend to fully compressed data that leaves the codec chip after processing.

claims containing the phrase "interim storage of ....outgoing video data." It assigns three reasons why this is so. First, it invokes Fed. R. Civ. P. 56(f) and suggests that it needs additional notice and a reasonable time to respond. Second, AVT offers a proposed written description, expanding on a discussion had at the *Markman* hearing when this issue came up. And third, it argues that the prosecution history record actually reflects that AVT deleted everything the patent examiners on reexamination intended should be deleted from the patent. To the extent that AVT's argument is premised on what happened when the patent was originally allowed, prior to reexamination, its argument is entirely unconvincing; that ancient history was wiped out by the reexamination. I confess that I do not follow the rest of the argument – nor have the defendants been given an opportunity to offer any rebuttal to it.

I am not going to grant defendants summary judgment at this point. Much as I would like to spare everyone's clients additional expense, I believe the better part of valor is for defendants to move for summary judgment on a full record, with AVT having the opportunity to develop its counter-arguments – including, if necessary, offering testimony from experts (as long as they do not purport to be experts in the law). It may also be that, in light of these claim constructions, one or more parties would wish to proffer additional grounds in support of summary judgment (such as non-infringement).

The parties should meet and confer and propose a schedule to the court.

Dated: February 1, 2013

_____
U.S.D.J.

BY ECF TO ALL COUNSEL

10